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RHYSSOPLAX BALIENSIS, A NEW SPECIES OF CHITON FROM INDONESIA (MOLLUSCA: POLYPLACOPHORA: CHITONIDAE)

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Abstract.—*Rhyssoplax baliensis* is described from Bali, Indonesia. It differs from *R. burmana* (Pilsbry, 1893) by its smooth jugum, central mucro on valve VIII, and slightly convex valve I; from *R. densilirata* (Pilsbry, 1893) by having a banded girdle and by its narrower longitudinal ribs which bend medially and are more nodulose and widely spaced; and from *R. vauclusensis* (Hedley & Hull, 1909) by its smooth jugum, more numerous and smoother ribs on the lateral triangle, and smoother, less inflated girdle scales.

A single example of a large chiton from Bali, Indonesia, in the collection of the Australian Museum, Sydney, represents an undescribed species of *Rhyssoplax.* While the study of many chiton species is made easier by the examination of numerous examples, I do not hesitate to describe the present species due to the specimen's distinctiveness, size, and excellent condition which allows a detailed comparison with related *Rhyssoplax* species.

Abbreviations used in the text: AMS, Australian Museum, Sydney; ANSP, Academy of Natural Sciences of Philadelphia; BMNH, British Museum (Natural History), London; DMNH, Delaware Museum of Natural History, Greenville; MCZ, Museum of Comparative Zoology, Harvard University, Cambridge; and ZMK, Universitetets Zoologiske Museum, Copenhagen.

Class Polyplacophora Gray, 1821
Family Chitonidae Rafinesque, 1815
Genus *Rhyssoplax* Thiele, 1893

Use of *Rhyssoplax* at the generic level is not accepted by all malacologists. Van Belle (1978, 1983) and Kaas & Van Belle (1980) treated the group as a subgenus of *Chiton* Linnaeus, 1758. Morphological features of the valves of both genera exhibit great plasticity and often are unreliable as taxonomic characters at the generic level. However, substantial radular differences exist between *Chiton,* which is primarily a New World group, and *Rhyssoplax,* which is represented abundantly in the Indo-Pacific region (Bullock 1988a, b).

Rhyssoplax baliensis, new species
Figs. 1–4, 8–11

Holotype.—Australian Museum, Sydney, C.60874, collected by T. Dranga.

Type locality.—Bali Island, Indonesia. Depth not recorded.

Description.—Animal moderately large, 47 mm in length, 24 mm in width. Valves subcarinate, angle about 115°. Valve I slightly convex; postmucronal slope of valve VIII concave anteriorly, convex posteriorly. Mucro somewhat blunt, central on valve VIII. Jugal region smooth; central areas with about 23 thin, longitudinal ribs which are more numerous and occasionally joined toward jugum. Lateral triangle raised, with seven or eight faintly nodular, radiating ribs; nodules more pronounced along posterior margin of lateral triangle. Terminal areas with numerous nodular, sometimes bifurcate radial ribs; anterior valve with about

43 ribs; posterior valve with about 33 ribs. Valve color very light cream orange; jugum pinkish with reddish brown speckles; seven small, dark brown splotches on longitudinal ribs along anterior edge of lateral triangle, additional splotches along posterior margin; longitudinal and radial ribs speckled with reddish brown. Girdle yellowish white with several splotches or bands of dull green or brown. Interior of valves white with fleck of dull reddish brown on each side of posterior slope of callus near mucro.

Tegmentum: Ventral layer of suprategmentum laterally with wedgelike, nearly transparent shelf. Subtegmentum not developed toward jugum, present laterally as thin layer of small canals (Fig. 8).

Esthete pores: Megalopores, each with surrounding micropores, scattered across central area; round to slightly ovate megalopores 1.6 to 2.6 times as large as round to ovate micropores (Fig. 9).

Articulamentum: Central depression of intermediate valves with numerous transverse slits in jugal tract. Primary slit-ray consisting of series of very small holes. Secondary slit-ray present laterally. Insertion teeth finely grooved, not deeply pectinate; pectination of intermediate and posterior valves proceeding anteriorly to lateral margins of apophyses. Slit formula 8/1/15.

Radula: [not available].

Girdle elements: Scales moderately large, roundly triangular, moderately inflated. Extensive ventrolateral reticular sculpture mostly hidden by overlapping scales. Central area with 15–16 thin, moderately pronounced ribs. Apical region with pustules which may be smaller and linearly arranged distally and at sides. Apical shelf barely evident (Figs. 10, 11). Ventral scales closely packed, rectangular, length 104–120 μm, width 23–28 μm. Marginal spicules oblong, bluntly pointed distally, rounded proximally, length 119–135 μm, width 35–43 μm.

Remarks.—Morphological features of the valves and girdle scales indicate that *Rhyssoplax baliensis* is related to *R. vauclusensis*

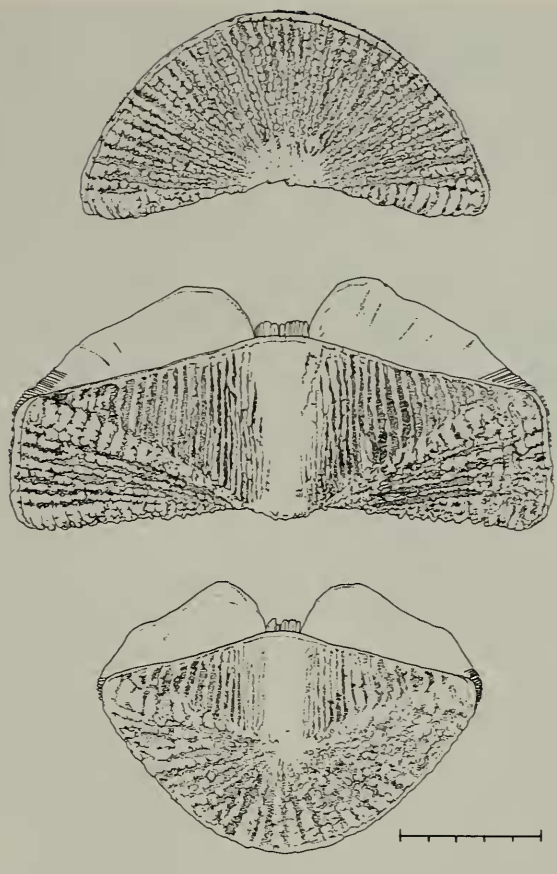
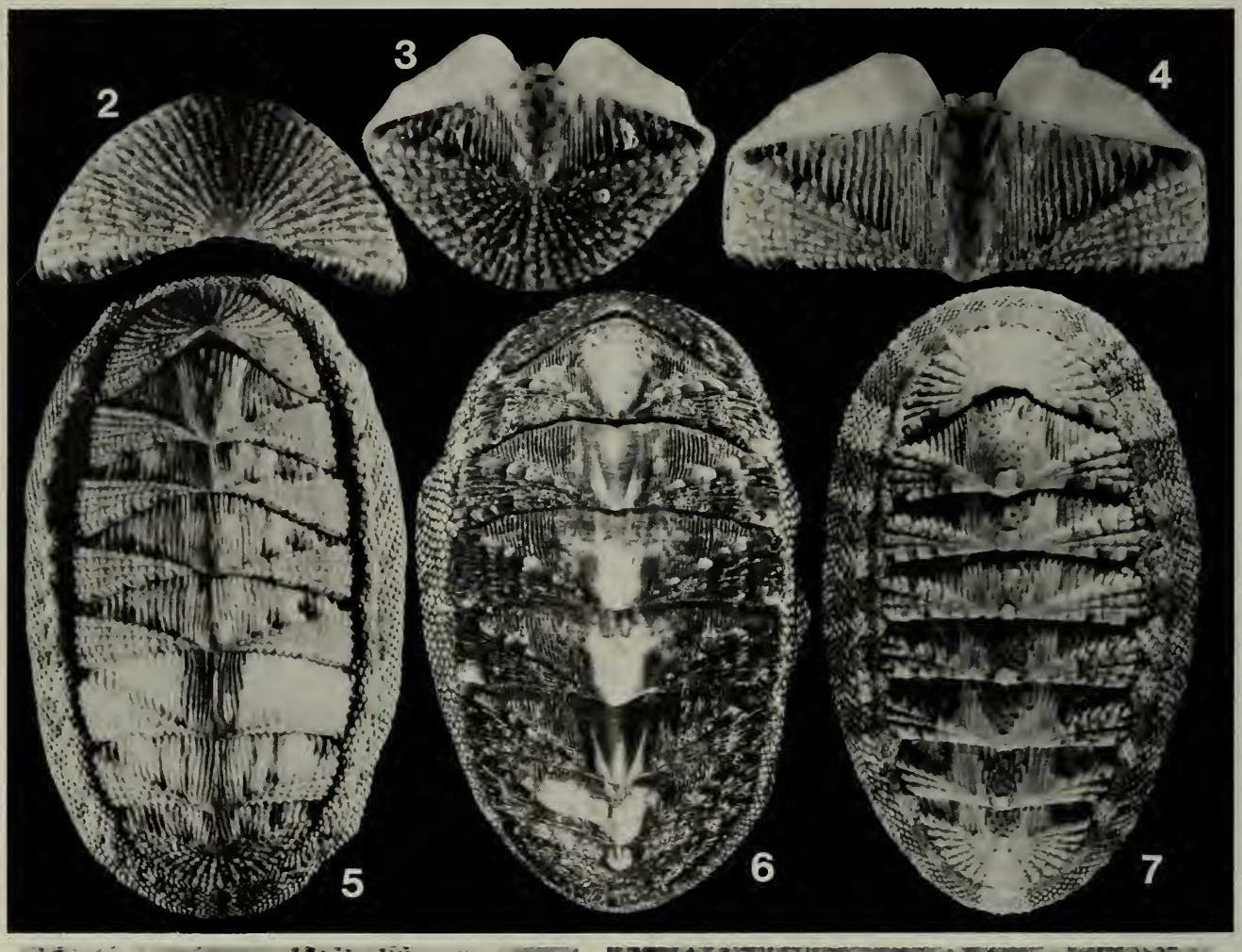


Fig. 1. *Rhyssoplax baliensis,* new species, holotype, AMS C.60874: Top, Anterior valve (I); Middle, Intermediate valve (IV); Lower, Posterior valve (VIII). Scale bar = 0.5 cm.

(Hedley & Hull, 1909) from southern Queensland and New South Wales, Australia (Iredale & Hull 1926); *R. densilirata* (Pilsbry, 1893), which occurs from the Philippine Islands [Ang (1967) as *Ischnochiton* (*Lepidozona*) *luzonicus* (Sowerby, 1841); and specimens in DMNH and ZMK] south to the Admiralty Islands (BMNH; see Fig. 6); and *R. burmana* (Pilsbry, 1893) from Waltair, India (BMNH; see Fig. 5), east to Burma. *Rhyssoplax baliensis* is differentiated from the sympatric *R. densilirata* by: (1) the narrower longitudinal ribs of the central area which bend medially, not laterally; (2) the ribs of the central area and lateral triangle which are more nodulose and widely spaced; (3) the fewer radial ribs on the end valves (about 43 on valve I and about 33 on valve VIII compared with up to 69 on valve I and up to 57 on valve VIII of *R. densilirata*); and (4) the banded girdle. The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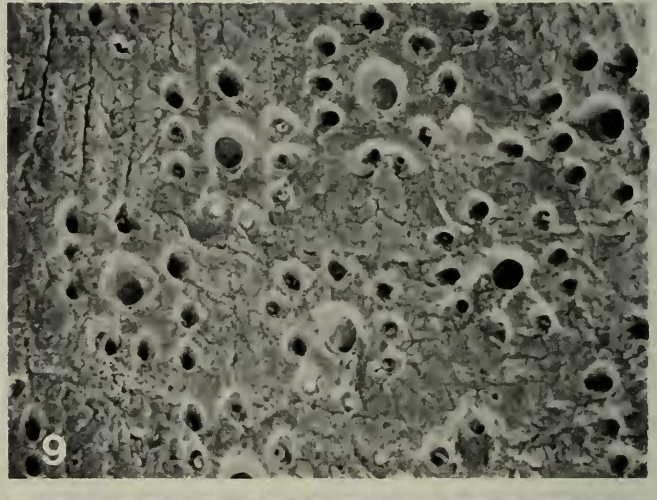
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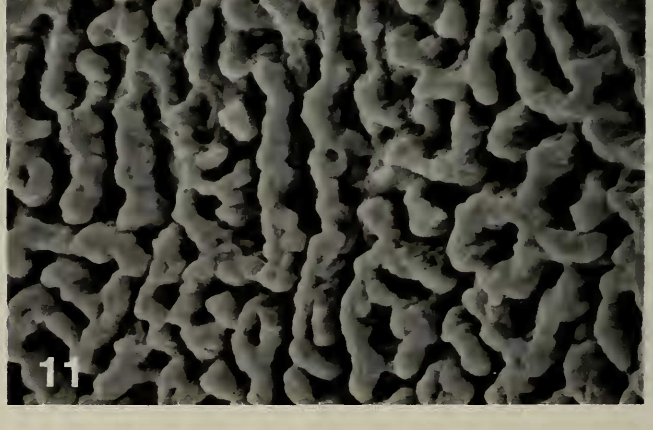
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girdle of examples of *R. densilirata* examined was never banded.

Rhyssoplax vauclusensis (Fig. 7) appears to be the closest known relative of *R. baliensis*. The former differs by having longitudinal ribs on the jugum, fewer, smoother radial ribs on the lateral triangle, and smoother, less inflated girdle scales with a cluster of elongate nodules distally on the apex.

Rhyssoplax burmana, which has conspicuous, narrow ribs on the central areas, differs from *R. baliensis* by its smaller size, ribbed jugum, slightly posteriorly acentric mucro on the posterior valve, fewer (4–6) ribs on the lateral triangle, and prominently concave anterior valve and postmucronal slope of the posterior valve.

Chiton vangoethemi Leloup, 1981, a recently described species from Madang Province, Papua New Guinea, differs from *R. baliensis* in its coloration, smooth jugal and central areas, and evenly rounded posterior outline of valve VIII. The smooth insertion teeth described by Leloup indicate that this species belongs in the Ischnochitonidae, not the Chitonidae.

Acknowledgments

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Figs. 2–7. *Rhyssoplax baliensis* new species, *R. densilirata* (Pilsbry), *R. burmana* (Pilsbry), and *R. vauclusensis* (Hedley & Hull): 2–4, Anterior, intermediate, and posterior valves, respectively, of *R. baliensis,* holotype, AMS C.60874, width valve IV, 17.5 mm; 5, *R. densilirata,* Damma Is., Admiralty Is., BMNH 1899.4.12.3, 45 mm (slightly curled); 6, *R. burmana,* Waltair, India, BMNH 1952.11.19.62, 23 mm; 7, *R. vauclusensis,* Shellharbour, New South Wales, Australia, MCZ 204376, 27 mm.

Figs. 8–11. Scanning electron micrographs of valve and girdle scale morphology of *Rhyssoplax baliensis* new species: 8, Anterior tegmental innervation, ×70; 9, Esthete pores of central area, ×280; 10, Dorsal surface of girdle scale, ×137; 11, Ventrolateral reticular sculpture of girdle scale, ×665.